

W A S H I N G T O N
H I G H E R
EDUCATION
C O O R D I N A T I N G B O A R D

May 2004

Bachelor of Science in Electrical Engineering
Eastern Washington University

INTRODUCTION

The Higher Education Coordinating Board (HECB) is scheduled to act during its May 20 meeting, on a proposal by Eastern Washington University (EWU) to establish bachelor of science degree programs in electrical engineering at North Seattle Community College (NSCC) in fall 2004, and at the main campus in Cheney in fall 2006. Under state law, the HECB is directed to approve proposals for new degree programs from the state's public four-year college and universities.

At its March 25 meeting, the Board reviewed the proposal with its staff and representatives of Eastern Washington University, heard public testimony, and decided to issue a decision on the proposal on May 20. The staff's report to the Board and several appendices are available in the Board's March 2004 meeting packet at the following web site:

<http://www.hecb.wa.gov/docs/packets/2004/March/boardpacket.pdf>

A copy of the university's original proposal is available upon request at the HECB office in Olympia.

This document contains a brief overview of the proposal, the HECB staff's findings, and a recommendation for Board consideration.

SUMMARY OF EASTERN WASHINGTON UNIVERSITY PROPOSAL

On December 1, 2003, EWU submitted a proposal to offer a new Bachelor of Science in Electrical Engineering (BSEE) degree through two different methods of delivery. A more complete description of the prospective program appeared in the information packet for the Board's meeting on March 25, 2004. The EWU proposal may be summarized as follows:

- In fall 2004, the university would begin offering upper-division courses at North Seattle Community College leading to the BSEE degree. Students from NSCC and other community colleges – and presumably other four-year colleges – would be admitted to the degree program after completing necessary prerequisites. The program at North Seattle would initially enroll 25 full-time equivalent students and is projected to grow to 40 FTE by 2008. As initially proposed, the program would include one full-time faculty member at NSCC. At least one additional full-time tenure track faculty member would be stationed at North Seattle Community College by 2004-05.

- In fall 2006, the university would begin a full four-year baccalaureate program at the main campus in Cheney. Because all four years of the program would be available at the main campus, students could enroll as freshmen at EWU or transfer from other institutions. This program initially would enroll 20 FTE and is projected to grow to 30 FTE by 2008. Instruction would be provided primarily on-site at Cheney.

The two-phase EWU proposal marks the first time in Washington that a regional comprehensive university has sought state approval for an electrical engineering baccalaureate degree program. The university's eligibility was established through the enactment in 2003 of special legislation that permitted all Washington public universities to offer electrical engineering programs, subject to HECB approval. Previously, electrical engineering was one of the "major lines of instruction" reserved in state law for the University of Washington and Washington State University. Both of the public research universities offer bachelor's programs in this field, as do Gonzaga University, Henry Cogswell College, Seattle Pacific University, Seattle University and Walla Walla College.

HECB PROGRAM APPROVAL GUIDELINES

The Board evaluates and approves new degree programs in accordance with the statutory direction in RCW 28B.80.340, as described in its January 2001 Guidelines for Program Planning, Approval and Review. To earn the Board's approval, an institutional proposal, informed by staff analysis, external review and public comment, must document the following elements:

1. Clear evidence of state need for the program and consistency with the institution's mission;
2. A development plan and proposed budget, including the amounts and sources of all funds;
3. Assurance that external and internal reviews attest to the quality of the program;
4. Avoidance of unnecessary duplication of existing programs;
5. A plan to assess overall program progress and effectiveness, including student achievement and learning outcomes;
6. A plan to expand opportunity for students from segments of the state population that have been historically under-represented in college participation; and
7. The appropriate use of technology to support instruction.

FINDINGS AND RECOMMENDATIONS FOR BOARD ACTION

The HECB staff submits the following findings and recommendations for consideration by the Board at its May 20 meeting.

Eastern Washington University deserves to be commended for its responsiveness to the state's information technology industry – primarily represented by the AeA, formerly known as the American Electronics Association – in developing the 2003 legislation that cleared the way for EE programs at the regional universities, and in expeditiously submitting the program proposal and additional clarifications to the HECB. The university has been consistently responsive to the requirements of this process and the information needs of the HECB and its staff.

While the staff cannot recommend the Board's approval of the EWU proposal as submitted, it does recommend conditional approval of the proposal to establish the BSEE program at the main campus in Cheney, beginning as early as fall 2005. The rationale for this recommendation appears below.

Evidence of need

The university has not clearly demonstrated the state's need for the proposed programs, as called for in the Board's degree approval guidelines. In the near term, it appears the state has a sufficient supply of electrical engineers – and a sufficient number of students who are on track to receive EE degrees from existing programs – to meet industrial employment needs in Washington during a soft job market. There is significant disagreement about whether or when employment in this field will rebound. The Board heard testimony during its March 25 meeting that many recent electrical engineering graduates and experienced professionals remain unemployed despite excellent academic and career records. Further, some experts believe recent corporate out-sourcing of electrical engineering jobs to other countries reflects a fundamental restructuring of operations by U.S. employers that will suppress long-term job growth for electrical engineers and others in related fields. (For further discussions of this issue, see the December 2003 and January 2004 editions of *PRISM Magazine*, a publication of the American Society for Engineering Education.)

Rather than authorizing new offerings in the same regions served by existing programs, the state could better address future job growth in this field by increasing its standing investment in the successful, publicly supported programs at the University of Washington in Seattle and at Washington State University in Pullman. In this context, it is important to note that significant unused enrollment capacity exists at private universities in Seattle, Spokane and elsewhere – again, in the same areas that would be served by EWU's proposed programs. Further, the Legislature and Governor last year directed Washington State University to create and operate a state institute for engineering and science at its Vancouver campus in Southwest Washington. The HECB staff expects the university to seriously consider offering its existing EE program through the Vancouver campus as part of its effort to address economic development and job opportunities in the Vancouver-Portland, Oregon metropolitan area.

Neither has Eastern Washington University convincingly demonstrated sufficient interest by qualified prospective students to participate in the proposed programs at North Seattle Community College or at the main campus in Cheney. EWU reports that more students seek admission to the existing UW and WSU programs than enroll each year. But a student's expressed desire to attend a program does not necessarily mean the student qualifies for admission. EWU cites estimates that a number of community college students might seek admission to a new public university program, but these estimates are based on a limited survey of students from only one community college. A small number of those students pursued education in fields related to electrical engineering. The HECB staff did not feel these estimates were sufficient to justify support for the university's proposal.

Program quality

The university has not demonstrated the proposed programs will achieve the high quality that is required to earn HECB approval. The staff bases this judgment on several factors.

The primary difficulty may be the university's generally laudable effort to respond to attempts by industry to convince the state to expand existing engineering programs in the face of severely restricted funding. The AeA has expressed particular frustration that the University of Washington did not enlarge its program in Seattle during the technology boom of the late 1990s, despite repeated urging by industry to do so. In its attempt to be responsive to industry needs, especially in the Seattle area, Eastern Washington University has offered what amount to *two* distinct, new degree programs in one proposal. In an effort to begin immediately serving students at the NSCC location, the university has proposed to offer the final two years of the BSEE program *before* the four-year program is established at Cheney.

This approach causes serious concern. It is unprecedented in Washington for a university to propose establishment of a complex new baccalaureate degree program at a remote site *before* that program is well established at the main campus. In particular, the proposal for the North Seattle Community College campus is lacking in the number of full-time faculty and instructional staff on-site and in provisions for the wide range of student opportunities for research, personal lab instruction, and other components of the existing programs at the UW and WSU. The HECB staff believes EWU – and state residents – would be better served if the university brought forward a more focused proposal to establish a four-year bachelor of science in electrical engineering program at the main campus in Cheney before extending a portion of that program to a location at the opposite end of the state.

The North Seattle portion of EWU's proposal is inadequate for other reasons as well. The community college campus lacks an upper-division component – neither teaching faculty, graduate assistants nor support services for four-year university students are currently available there – and the proposal does not contemplate a significant investment of resources in those areas. This situation severely limits the availability of elective courses to students at the North Seattle campus. In sum, it is unlikely that the electrical engineering students who would enroll this fall, as proposed by the university, would have the high-quality university experience that Washington State residents require.

Resource considerations

The issue of proposed funding for the new programs bears directly on the issues of quality. While there may be debate over the adequacy of EWU's proposed funding, the HECB staff has concluded that the proposed level of state investment is insufficient to support the number and quality of needed faculty and instructional staff – particularly at the NSCC site – as well as necessary student advising and counseling services. These are only two critical components of the electrical engineering proposal. Eastern's projected direct program costs at full enrollment (beginning in 2007-08) will not enable the program to achieve the high quality that industry seeks and state residents should expect.

One result of this under-funding would be felt directly by students: at 23 students per full-time faculty member, Eastern's program would have larger average class sizes than any other program in the state. By comparison, the student-faculty ratio is 15-to-1 at Gonzaga University, 17-to-1 at Henry Cogswell College, 13-to-1 at Seattle Pacific University, 11-to-1 at Seattle University, 18-to-1 at the University of Washington and Walla Walla College, and 12-to-1 at Washington State University.

This combination of few full-time EWU faculty and staff – especially at the North Seattle Community College site – larger than average class sizes, and inadequate provisions for critical student services forces the HECB staff not to recommend approval of the proposal that is before the Board without making certain revisions.

Recommendation for HECB action

Eastern Washington University is asking the HECB's approval for a degree proposal that is, in essence, two programs within one proposal. This approach is problematic and has prompted the HECB staff to recommend the Board:

- 1. Reject the portion of EWU's proposal that calls for creation of a BSEE program at North Seattle Community College beginning in fall 2004.** The staff believes the university, its students, and the state's citizens would be better served if EWU established new programs on its main campus before transporting them to remote locations, especially sites where it has no standing presence.
- 2. Grant *conditional* approval to EWU to establish a BSEE program at the main campus in Cheney that may begin as early as fall 2005.** This conditional approval is recommended because the proposal would need to be amended and updated to reflect the fact that it would be initiated at Cheney rather than at North Seattle Community College. This conditional approval would require the university to fulfill the following requirements, subject to the approval of the HECB executive director, before admitting students into the new program:
 - Update the documentation of need for a new program in the Spokane metropolitan region and Washington state in sufficient time to allow for the recruitment of students and the recruitment/hiring of faculty, prior to program initiation;
 - Attain an annual average student-to-faculty ratio (measured on the basis of full-time equivalents) of no more than 18 electrical engineering FTEs to one full-time electrical engineering faculty to ensure adequate program quality and individual student attention. Future plans must describe a process to expand the faculty to include additional full-time and part-time faculty necessary to sustain this faculty-student ratio or a ratio required by ABET for accreditation;

- Establish a program advisory committee *before* the start of the proposed program to ensure the curriculum responds to emergent and future needs and opportunities for electrical engineering students and employers;
- Create a plan to recruit and retain a diverse student population in the new program, specifically focused on the Cheney campus;
- Specifically address the sources and amounts of funding that will be needed to establish and operate a program, taking into consideration that high-demand enrollment funding may not be made available by the state; and
- Seek full accreditation for the program at Cheney, after the first class graduates, from the Accreditation Board for Engineering and Technology *before* proposing expansion to remote locations.



STATE OF WASHINGTON
HIGHER EDUCATION COORDINATING BOARD

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RESOLUTION NO. 04-07

WHEREAS, Eastern Washington University has requested Higher Education Coordinating Board (HECB) approval to establish Bachelor of Science in Electrical Engineering (BSEE) programs at North Seattle Community College and at the university's main campus in Cheney; and

WHEREAS, The university is to be commended for its responsiveness to requests by the AeA (formerly known as the American Electronics Association) to establish an electrical engineering program in the Seattle area to complement existing EE programs at public and private universities; and

WHEREAS, The university has not clearly demonstrated the state's need for a new publicly-funded BSEE program in addition to the existing programs at the University of Washington, Washington State University, and several private colleges and universities across the state; and

WHEREAS, Neither has the university clearly demonstrated sufficient interest among qualified prospective students to participate in the proposed programs; and

WHEREAS, The university has not demonstrated the proposed programs will achieve the high quality that is required to earn HECB approval, in part because the proposal does not identify the resources needed to hire sufficient numbers of qualified faculty to establish and maintain the programs as proposed;

THEREFORE, BE IT RESOLVED, That the HECB does not approve the BSEE proposal as submitted by Eastern Washington University to establish a program at North Seattle Community College in fall 2004; and

THEREFORE, BE IT FURTHER RESOLVED, That the HECB conditionally approves the university's proposal to establish the BSEE program at the main campus in Cheney, on condition that the university fulfill the following requirements before beginning the program, subject to the approval of the HECB executive director:

- Update the documentation of need for a new program in the Spokane metropolitan region and Washington state in sufficient time to allow for the recruitment of students and the recruitment/hiring of faculty, prior to program initiation;
- Attain an annual average student-to-faculty ratio (measured on the basis of full-time equivalents) of no more than 18 electrical engineering FTEs to one full-time electrical engineering faculty to ensure adequate program quality and individual student attention. Future plans must describe a process to expand the faculty to include additional full-time and part-time faculty necessary to sustain this faculty-student ratio or a ratio required by ABET for accreditation;

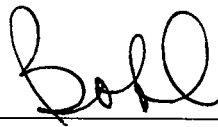


- Establish a program advisory committee *before* the start of the proposed program to ensure the curriculum responds to emergent and future needs and opportunities for electrical engineering students and employers;
- Create a plan to recruit and retain a diverse student population in the new program, specifically focused on the Cheney campus;
- Specifically address the sources and amounts of funding that will be needed to establish and operate a program, taking into consideration that high-demand enrollment funding may not be made available by the state; and
- Seek full accreditation for the program at Cheney, after the first class graduates, from the Accreditation Board for Engineering and Technology *before* proposing expansion to remote locations.

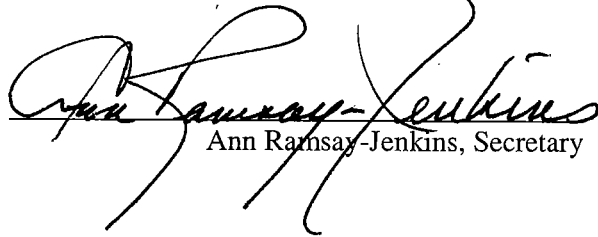
Adopted:

May 20, 2004

Attest:



Bob Craves, Chair



Ann Ramsay-Jenkins, Secretary